U.S. Payload Operations Data File Management Plan

International Space Station Program

Flight Projects Directorate
FD33/Payload Systems Group

December 1999

Baseline Rev A

National Aeronautics and Space Administration
International Space Station Program
Marshall Space Flight Center
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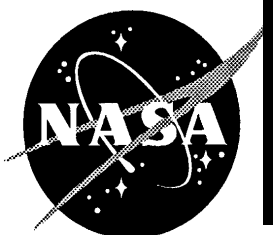

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REVISION AND HISTORY PAGE

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U.S. PAYLOAD OPERATIONS DATA FILE MANAGEMENT PLAN
FLIGHT PROJECTS DIRECTORATE

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INTERNATIONAL SPACE STATION
U.S. PAYLOAD OPERATIONS DATA FILE MANAGEMENT PLAN
FLIGHT PROJECTS DIRECTORATE

SSP 58700
BASELINE REV A

DECEMBER 1999

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PREFACE

This document is the main volume of the United States Payload Operations Data File (U.S. PODF) Management Plan (SSP 58700). It contains a high-level description of the activities required to manage the U.S. PODF.

Listed below is the Main Volume and all the Annexes, which expand the guidelines and policies of the U.S. PODF Management Plan into payload requirements, working agreements, and work techniques. The Annexes are separately published documents and are updated on an as-needed basis.

Document	Title
Main Volume	U.S. PODF Management Plan (SSP 58700)
1.	U.S. PODF Definition, Annex 1 (SSP 58700-ANX1)
2.	U.S. PODF Configuration Control, Annex 2 (SSP 58700-ANX2)
3.	U.S. PODF Procedure Verification and Validation, Annex 3 (SSP 58700-ANX3)
4.	U.S. PODF Preparation and Publication Plan, Annex 4 (SSP 58700-ANX4)
5.	U.S. PODF Payload Display Review Plan, Annex 5 (SSP 58700-ANX5)
6.	U.S. PODF Payload Display Developers Guide, Annex 6 (SSP 58700-ANX6)
7	U.S. PODF Timeliner Automated Procedures, Annex 7 (SSP 58700-ANX7)

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INTERNATIONAL SPACE STATION PROGRAM

U.S. PAYLOAD OPERATIONS DATA FILE MANAGEMENT PLAN
FLIGHT PLANNING DIRECTORATE OPERATION CONTROL

LIST OF CHANGES

DECEMBER 1999

All changes to paragraphs, tables, and figures in this document are shown below:

CCBD #	ENTRY DATE	CHANGE	PARAGRAPH(S)
PODFCBD PB06-99-0001	January 1999	Baseline	All
PODFCB FD33-99-0001R1	December 1999	Baseline Rev A	All

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SECTION 1, INTRODUCTION

1.1 PURPOSE

The United States Payload Operations Data File (U.S. PODF) Management Plan documents the guidelines and processes for all U.S. PODF related activities carried out under the direction of the Payload Operations Integration Function (POIF). This plan defines the policies, guidelines, protocol, roles, and responsibilities of the International Space Station (ISS) community members in the development, verification, validation, maintenance, and control of payload procedures and displays comprising the U.S. PODF.

The U.S. PODF Management Plan Annexes provide detailed information on the U.S. PODF definition and the processes used in preparing and managing the U.S. PODF to support ISS operations. The Annexes also describe the tasks required and interface needed to carry out the day-to-day management of the U.S. PODF. Appendix C contains a description of the contents of each Annex.

In order to determine the latest version of this document, consult the document list on the POIF homepage at http://mole.msfc.nasa.gov/station. The latest version also may be accessed via Program Automated Library System (PALS) at http://issa-www.jsc.nasa.gov/cgi-bin/dsql+/ORAP?-h+palshome.

1.2 SCOPE

Procedures, displays, and flight activities for all payloads, regardless of national affiliation, that are resident in the U.S. Laboratory Module or are attached to U.S. element components of the ISS, such as U.S. payloads located outside the U.S. Lab, but still connected to the Payload Multiplexor/Demultiplexor (PL MDM), come under the authority of this plan. This also includes Payload Operations Integration Center (POIC)-developed procedures and flight displays supporting multi-element payload operations. The activities involved in this process can be seen in Figure 1-1.

1.3 CHANGE AUTHORITY

This plan was developed under the authority vested in the Marshall Space Flight Center (MSFC) Flight Projects Directorate (FPD) and the POIF by the Operations Data File Control Board (ODFCB). The charter and scope of authority of the U.S. Payload Operations Data File Control Board (U.S. PODFCB) are defined in the Operations Data File (ODF) Management Plan, which describes the processes for definition, development, and control of all ODF information for the ISS program.

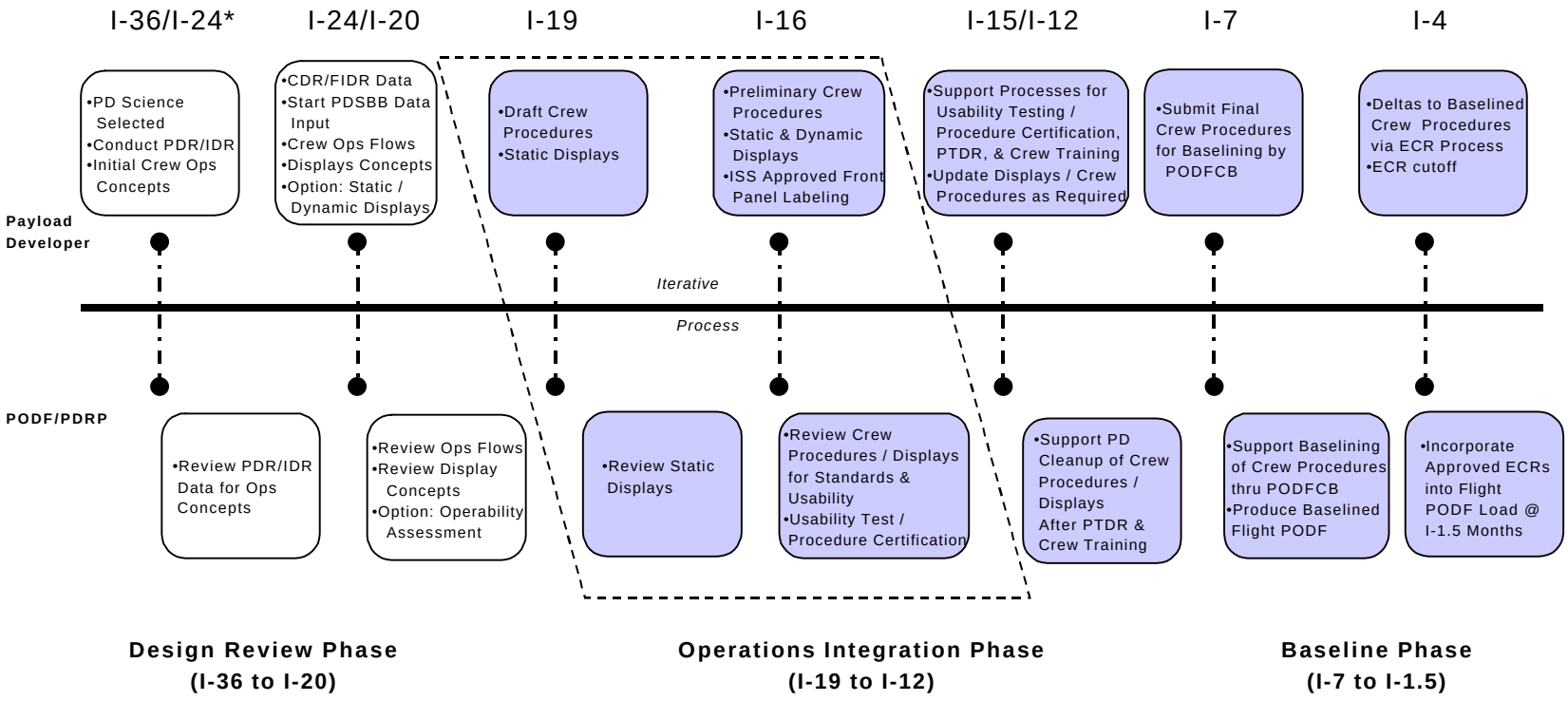

FIGURE 1-1 U.S. PODF/PDRP PROCESS OVERVIEW

1.4 PUBLICATION AND REVISION

The POIF, at MSFC, is responsible for overseeing the preparation, coordination, and maintenance of this document. The Chairperson of the U.S. PODFCB approves and signs this document and all changes to it after approval by the U.S. PODFCB members.

All Annexes to this document are published separately. If there are comments or questions on this plan, contact the appropriate book manager.

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SECTION 2, DOCUMENTS

2.1 APPLICABLE DOCUMENTS

The following documents include specifications, standards, guidelines, procedures, handbooks, and other special publications. These documents, of the exact issue shown, form a part of these requirements to the extent specified herein. Unless the exact issue and date are identified, the "Current Issue" shall apply. Inclusion of applicable documents herein does not in any way supersede the programmatic order of precedence.

SSP 30233	Space Station Requirements for Materials and Processes
SSP 50200-01	Station Program Implementation Plan, Volume 1: Station Program Management Plan
SSP 50200-07	Station Program Implementation Plan, Volume 7: Training
SSP 50200-08	Station Program Implementation Plan, Volume 8: Increment Execution Preparation
SSP 50200-09	Station Program Implementation Plan, Volume 9: Realtime Operation
SSP 50252	Operations Data File Management Plan
SSP 50253	Operations Data File Standards Document
SSP 50254	Operations Nomenclature
SSP 50313	Display and Graphics Commonality Standards Document
SSP 52000-PDS	Payload Data Set Blank Book
SSP 52000-PIA	Payload Integration Agreement (PIA)
SSP 58303	Team Definition Document

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SECTION 3, PAYLOAD OPERATIONS DATA FILE

3.1 U.S. PODF DEFINITION

The U.S. PODF is a component of the ISS ODF. The ODF is the collection of all procedures and reference information that supports Station on-board operations. The procedures contained in the U.S. PODF are used by flight controllers, the on-board crew, and the on-board PL MDM automated procedure executor software to operate and maintain Station payloads, Payload Support Systems (PLSS), and Laboratory Support Equipment (LSE). Payload flight displays operating in any U.S. element or those used to operate any U.S. payload are verified and controlled by the U.S. PODFCB. These displays are considered part of the U.S. PODF and are managed by Annexes 5 and 6 of this management plan. The overall contents of the U.S. PODF will change from flight to flight, and there will also be continuous updates during each flight. The POIC will manage changes for the U.S. PODF to support crew training and flight operations according to the U.S. PODF Management Plan, Annex 2.

3.2 U.S. PODF STRUCTURE AND ORGANIZATION

The U.S. PODF consists of the following components:

A. Crew Procedures - Electronic Format (CD ROM)

B. Reference Information - Electronic Format (CD ROM)

C. U.S. PODF Contents Definition (PCD) Document - Electronic Format (CD ROM) and Hardcopy

D. Payload Systems Handbook (PSH) - Electronic Format (CD ROM) and Hardcopy

E. Payload Reference Handbook (PRH) - Hardcopy

F. Procedure Support Items - Clips, Velcro, Pens, Pencils, Markers, etc.

G. Automated Procedures - Electronic Format (Uplink to PL MDM Only)

H. Flight Displays - Display Version or Software Load Format as required

I. Flight-Unique Items - Format as required

J. Flight Controller Procedures - Format as required

Crew procedures, reference information, the U.S. PODF Contents Definition Document, and the PSH will be carried to the ISS on CD ROM to facilitate configuring the on-board Operations Local Area Network (OPS-LAN) server for flight operations. Changes to these files will be uplinked from the ground on a routine basis as the flight progresses. The electronic version of these items will be maintained on the ground in the Payload Information Management System (PIMS), a system within the POIC, or in the MSFC Online Project Management System (OPMS) until flight. Figure 3-1 provides a conceptual hierarchy of the electronic components of the U.S. PODF. The actual hierarchy for a given flight will be designed to flight-specific or increment-specific requirements and documented in the PCD document.

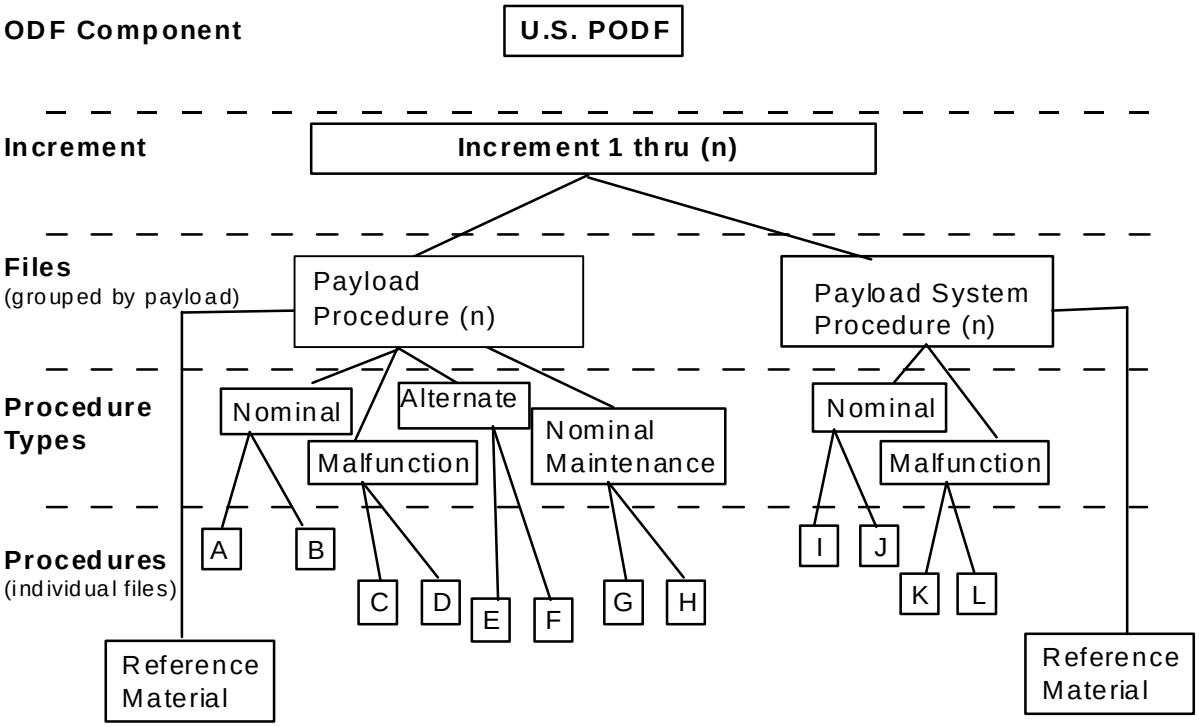

FIGURE 3-1 U.S. PODF FILE STRUCTURE

The PCD document, the PSH, and the PRH will be carried to Station in hardcopy format. These documents will be updated on a per increment basis. Paper versions will be updated during increment operations as needed.

The PCD provides a summary of all flight-specific content of the U.S. PODF and the specific location of U.S. PODF items. It is published in hardcopy format to support quality

checks at Kennedy Space Center (KSC) and to provide the crew with a ready reference to U.S. PODF content in the event of an on-board OPS-LAN failure. This document is developed and produced by POIC from information gathered through the Payload Data Set Blank Book requirements.

The PSH is published in hardcopy format to facilitate transport of multi-element procedures from module to module during crew execution. Also, Command and Data Handling (C&DH) system, PLSS, payload procedures, and information necessary to control safety hazards and instrument health are contained in the PSH for accessibility by the crew in the event of an OPS-LAN failure. This document is developed and produced by POIC from information gathered through the Payload Data Set Blank Book requirements.

The PRH contains hardcopy information needed by the crew to operate the complement of U.S. payloads and the specific international payloads that are under U.S. PODFCB authority. The PRH contains payload-specific cue cards, photographic material, schematics, and general information that do not easily lend themselves to being used in an electronic format by the crew. This document is developed and produced by POIC from information gathered through the Payload Data Set Blank Book requirements.

All paper products (including cue cards) shall conform to the standards defined in SSP 30233, Space Station Requirements for Materials and Processes, and SSP 50253, ODF Standards. The U.S. PODF Materials List and the Fabricated Items Specifications are contained in the U.S. PODF Management Plan, Annex 4.

Procedure support items such as clamps, clips, Velcro, pens, pencils, and markers are packed with the U.S. PODF physical products. These items support the crew needs for securing hardcopy procedures, flight messages, labels, and other items at the on-board work site and for annotating and marking up paper products.

Automated Procedures shall always be in electronic format and uplinked from the POIC to the PL MDM. Some automated procedures will be executed in an interactive mode by the crew. These procedures will have crew-readable versions uplinked to the PL MDM for viewing with the Automated Procedure Viewer (APV) software residing on the payload Portable Computer System (PCS). Automated procedures identified pre-flight shall be listed and described in the PCD.

Payload flight displays under U.S. PODFCB authority are resident on payload facility-provided hardware/laptops, or on the payload PCS. Software display applications for EXpedite the PRocessing of Experiments to Space Station (EXPRESS) laptops and the payload PCS are baselined by the U.S. PODFCB and stored in PIMS or OPMS for download by the Payload Software Integration and Verification (PSIV) Team to perform the flight build. These displays are sent from the ground as part of the vehicle/payload reconfiguration process for the flight/increment. Payload facility laptop/hardware displays are assigned a version

control number by the Payload Display Review Panel (PDRP) (Display baselining process TBR). This version control number shall be used by the Payload Developer (PD) to document the flight software load configuration that is integrated for flight.

Flight-unique items are defined on a flight-by-flight basis. Formats are determined as part of the operations preparation cycle and should be documented as early as possible in the Payload Data Library (PDL) payload data set.

SECTION 4, ORGANIZATIONS INVOLVED IN U.S. PODF MANAGEMENT

4.1 RESPONSIBILITIES OF THE U.S. PODF CONTROL BOARD

The U.S. PODFCB is chartered by the ODFCB and the ISS Payload Control Board (PCB) to develop, approve, and implement the policies and processes which govern the verification and flight approval of crew procedures and payload operations information contained in the U.S. PODF. The Integrated Display And Graphics (IDAGS) Board, in conjunction with the PCB, has also assigned responsibility to the U.S. PODFCB to develop, approve, and implement the verification and flight approval policies and processes which govern payload flight displays contained in the U.S. PODF. The U.S. PODFCB responsibilities include:

A. Develop, baseline, and implement the U.S. PODF policies and processes for ISS payload procedure and display verification and approval.

B. Enforce program-level policy and product standards for payload procedures and displays under U.S. PODFCB authority.

C. Define, verify, integrate, approve, and deliver the U.S. PODF for each ISS flight and increment as necessary to support the payload complement.

D. Establish and operate the U.S. PODFCB to provide approval of flight procedures and displays for flight, resolve issues impacting crew training and flight readiness, and provide flight integration status to Program Management.

E. Develop, baseline, and implement the policies and processes for verification and approval of payload procedures and displays delivered to the U.S. Systems Operations Data File (U.S. SODF) and the Shuttle Flight Data File (FDF) in support of ISS missions.

F. Define, verify, integrate, approve, and deliver the payload procedure, as well as any display, inputs to U.S. SODF and/or FDF for each ISS flight and increment as required.

G. Ensure all operational hazard controls approved by the Payload Safety Review Panel (PSRP) are correctly implemented in crew procedures and displays under U.S. PODFCB authority.

4.1.1 Responsibilities of the U.S. PODFCB Chairperson

The Chairperson of the U.S. PODFCB is appointed by the Payload Operations and Integration Department Manager of the FPD. The Chairperson's responsibilities include:

A. Managing the responsibilities of the U.S. PODFCB defined in Section 4.1.

B. Approving the U.S. PODF verification, integration, and delivery schedules for each flight or increment.

C. Certifying the U.S. PODF for each flight or increment.

D. Directing the development of and approving the U.S. PODF Management Plan and its Annexes.

E. Scheduling and conducting the U.S. PODFCB meetings.

F. Establishing the U.S. PODFCB agenda, directing attendance, assigning actions, publishing minutes, and dispositioning Engineering Change Requests (ECR) for U.S. PODF components.

G. Appointing U.S. PODFCB representative to the ODFCB and to other external boards, panels, and forums.

H. Maintaining liaison with the Johnson Space Center (JSC) Astronaut Office for crew representation, issues, and requirements affecting the U.S. PODF.

I. Formally notifying program, research program offices, and PDs of key personnel assignments and changes for the U.S. PODFCB and U.S. PODF Management Team.

4.1.2 U.S. PODFCB Members

Members of the U.S. PODFCB represent the major organizational elements across NASA and the International Partner (IP) Agencies that are affected by U.S. PODF management decisions. Each member speaks with authority for their organization as they carry out their U.S. PODFCB responsibilities. The U.S. PODFCB Chairperson determines the degree of member participation required to carry out U.S. PODFCB responsibilities. Membership is as follows:

A. Chairperson, Payload Operations and Integration Department (MSFC)

B. Representative, Payload Systems Operations Control (MSFC)

C. Representative, Payload Systems Data Management (MSFC)

D. Representative, Payload Systems U.S. PODF Management (MSFC)

E. Representative, Mission Design Group (MSFC)

F. Representative, Operations Training Group (MSFC)

G. Representative, Flight Crew Operations Directorate, Astronaut Office (JSC)

H. Representative, U.S. SODF (JSC)

I. Representative, POIC Operations Safety (MSFC)

J. Representative, Shuttle FDF as required

K. Representative, IPs as required

The PD representative shall support each board meeting where procedures or displays for that payload are on the agenda. The U.S. PODFCB Chairperson or other authorized person will notify the PD representative of the meetings they are required to attend within a reasonable time prior to the meeting. (See Section 4.1.1 for the responsibilities of the U.S. PODFCB Chairperson; see also the MSFC Space Station Payload Operations Integration Configuration Management Plan, document number TBD.) Table 4-I defines the responsibilities of each board member.

4.1.3 U.S. PODFCB Interfaces

The U.S. PODFCB must interface with the following organizations to accomplish its assigned activities:

A. The POIC Team (a subset of the FPD) directs and coordinates the development of processes for multi-element payload operations integration, planning, data management, commanding, voice management, operational safety, realtime file uplink, and PLSS operation. It maintains these functions during the ISS increment and is responsible for integration with IPs' functions involving payload operations. The Control Board Chairperson will come from this team.

B. The IDAGS Panel provides a working forum for review of displays produced by the IPs. It ensures that all displays for use on board shall comply with Display and Graphic Commonality Standards (DGCS) to maintain a common look, feel, and functionality. It acts as an integration panel providing approval-level integration oversight and guidance to all ISS partners.

C. IP Representatives direct and coordinate the development of the processes to define, establish, and maintain the ISS IP management of their ODF components.

TABLE 4-I U.S. PODF CONTROL BOARD MEMBERS' RESPONSIBILITIES

U.S. PODFCB Member	Participate in the development and maintenance of the U.S. PODF Mgt Plan & annexes	Participate in the establishment of the structure and content of the U.S. PODF	Provide inputs to the U.S. PODF preflight production template	Responsible for the authoring of the U.S. PODF procedures	Participate in the certification of the U.S. PODF to support operations	Participate in the resolution of U.S. PODF issues	Provide inputs to the ODF Standards (including common and U.S. PODF-unique)	Provide inputs to the OpNom document (including common and U.S. PODF-unique)	Participate in verification of the U.S. PODF
Chairperson, FPD rep.	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Operations Control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Data Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mission Design	Yes	No	No	No	Yes	Yes	Yes	Yes	No
Flight Crew Operations, Astronaut Office (JSC)	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes
U.S. SODF (JSC)	Yes	Yes	Yes	Yes**	Yes**	Yes**	Yes	Yes	Yes**
POIC Operations Safety (MSFC)	Yes	No	No	No	No	Yes	No	No	Yes
U.S. PODF Management	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
International Partners (as required)	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*	Yes*
STS FDF	No	No	No	Yes***	Yes***	Yes***	No	No	No
Operations Training	Yes	No	No	No	No	No	Yes	Yes	Yes

* Multi-element Procedures ** Joint Payload/Systems Procedures *** Joint Shuttle/Station Payload

D. The U.S. PODF PDRP assures payload procedure and display usability, and is chartered by the ISS PCB.

E. IP ODFCBs are chartered by the ODFCB to manage the development, configuration control, and publication of their component of the ODF. These control forums, along with the U.S. PODFCB, are responsible for carrying out the policies set by the ODFCB. (See Paragraph 4.5.2 for more information.)

F. The Astronaut Analysis and Integration Team (AIT) establishes flight crew operational philosophies and principles that relate to the ISS and provides coordinated guidelines, requirements, and crew positions on U.S. PODF issues.

G. The ODFCB charters the U.S. PODFCB to manage the development, configuration control, and publication of the U.S. PODF. The ODFCB establishes the policies and guidelines under which the U.S. PODFCB operates.

H. Users/Principal Investigators (PI)/PDs develop, implement, and maintain the processes and documents that provide payload operations and support. They coordinate, integrate, and support realtime payload operations.

I. PCB will work payload-specific technical issues which might occur as a result of a U.S. PODFCB action.

4.1.3.1 Payload Operations Integration Center

During execution of Space Station realtime operations, the POIC is responsible for the conduct of integrated Station-wide payload operations and is the single point of payload operations authority to the Mission Control Center - Houston (MCC-H). In this capacity, the POIC is responsible for integrating payload operations, including payload safety, payload operations planning and resource management, payload command and control, payload health and status monitoring, payload air-to-ground or space-to-ground traffic control, and payload anomaly resolution.

The POIC monitors crew activity, health and status data from all payloads and PLSS for verification of integrated payload safety. The POIC is responsible for verification of all payload and PLSS procedures, displays, and operations which have safety implications.

The POIC integrates the payload operations planning of each element into the integrated timeline. The POIC manages overall Space Station resources allocated for payload operations. These resources include power, water, thermal, vacuum, data, command, and crew time. It is the responsibility of the POIC to ensure that these resources are properly distributed so the crew can conduct the scheduled payload activities. Specifically for the U.S. PODF, the POIC will ensure:

A. Station-wide and integrated payload safety.

B. Coordination between POIC and MCC-H for any payload or PLSS procedure or display changes that affect payload hazard controls.

C. On-board payload information (software files, data tables, payload reference information), procedures, and displays will support planned operations.

D. Noninterference across all payloads.

E. Standards conformance across all U.S./Agenzia Spaziale Italiana (ASI) payload and payload system procedures.

4.1.3.2 U.S. PODFCB Interaction with Other ODF Component Control Boards

The U.S. PODFCB will interface with other ODF control forums on issues related to certain types of procedures and displays. These control boards and the specific types of procedures and displays are listed below.

A. European Space Agency (ESA) ODFCB multi-element payload procedures and displays which contain both U.S. and ESA payload-procedure-related steps.

B. National Space Development Agency of Japan (NASDA) ODFCB multi-element procedures and displays which contain both U.S. and NASDA payload-procedure-related steps.

C. Russian Space Agency (RSA) ODFCB multi-element procedures and displays which contain both U.S. and RSA payload-procedure-related steps.

D. Canadian Space Agency (CSA) ODFCB joint procedures and displays which contain both U.S. and CSA payload-procedure-related steps.

E. U.S. SODFCB joint U.S. systems/payload/PLSS procedures. Procedures involving critical functions within the U.S. element that reside in the U.S. PODF. Payload procedure inputs to the U.S. SODF.

F. Space Transportation System (STS) Flight Data File Control Board (FDFCB) payload procedures and displays of middeck payloads requiring operations on transport to ISS.

4.2 U.S. PODF MANAGEMENT TEAM

4.2.1 Responsibilities of the U.S. PODF Management Team

The U.S. PODF Management Team is responsible for establishing and implementing the U.S. PODF management processes. These processes are detailed in this document and its annexes and are controlled by the U.S. PODFCB. The U.S. PODF Management Team serves as the technical arm of the U.S. PODFCB for procedure and display standards enforcement and overall crew product usability. The U.S. PODF Management Team is responsible for the coordinated verification of payload procedures and displays by the Safety and Operations Control (OC) disciplines. The U.S. PODF Management Team is also responsible for fabricating physical U.S. PODF products and ensuring their timely delivery to KSC for launch.

The U.S. PODF Management Team provides the U.S. PODF Representative to the ODFCB. The U.S. PODF Representative to the ODFCB represents the interests of the U.S. PODFCB and its accountable payloads. In this capacity, the U.S. PODF Representative coordinates programmatic issues for the U.S. PODFCB and votes as an equal with the other members. The U.S. PODF Representative maintains cognizance of procedure standards issues, ODF definitions, ODF processes, and policies affecting the U.S. PODF and coordinates these with the U.S. PODFCB. ODF policies and decisions affecting costs to the U.S. PODFCB or PDs are carried to the PCB for guidance and resolution.

The U.S. PODF Management Team Lead appoints the U.S. PODF Representative to the ODF Standards Working Group. This representative is responsible for coordinating proposed and approved standards changes with the U.S. PODF Management Team and the PDs. This representative maintains cognizance of changes that affect PDs and represents the U.S. PD’s interests to the working group.

The U.S. PODF Management Team Lead appoints the U.S. PODF Representative to the IDAGS Panel. The U.S. PODF Representative to the IDAGS represents the interests of the U.S. PODFCB and its accountable payloads. In this capacity, the U.S. PODF Representative coordinates programmatic issues for the U.S. PODFCB and votes as an equal with the other members. The U.S. PODF Representative maintains cognizance of display standards issues, IDAGS definitions, IDAGS processes, and policies affecting the U.S. PODF and coordinates these with the U.S. PODFCB. IDAGS policies and decisions affecting costs to the U.S. PODFCB or PDs are carried to the PCB for guidance and resolution.

The U.S. PODF Management Team is responsible for developing training materials and providing training to all ISS personnel who develop ISS on-board flight displays or write crew procedures for ISS payloads and payload support operations. The U.S. PODF Management Team provides mentoring to the procedure and display development personnel on standards and operability of payload design to enhance crew operations performance and mission success for payloads.

The U.S. PODF Management Team staffs the PODF Support console position during ISS flight operations. The U.S. PODF Management Team Lead selects personnel for this assignment and provides on-call staff to support the development, validation, and verification of flight changes to procedures and displays. The PODF Support position is responsible for reviewing procedure and display changes resulting from realtime Operations Change Requests (OCR) and verifying for standards and safety compliance. For procedures, the PODF Support position is responsible for integrating the approved changes into the U.S. PODF flight procedure libraries for flight Manual Procedure Viewer (MPV) operations. Display changes are coordinated with the appropriate software integration organizations such as the Payload PSIV Team or the PD's software integration support personnel. The PODF Support position works closely with the appropriate MCC-H and POIC positions to coordinate uplink of procedures and displays. Changes affecting future increments are identified to the U.S. PODF Increment Manager for coordination of POIC action. The U.S. PODF Management Team Lead is responsible for defining the training requirements and certifying personnel for the PODF Support console position.

4.2.2 U.S. PODF Increment Manager Responsibilities

The U.S. PODF Management Team Lead will assign Increment Managers for the U.S. PODF. The U.S. PODF Increment Manager is accountable to the U.S. PODFCB Chairperson for managing the end-to-end activities necessary for getting an increment's U.S. PODF verified and on-orbit. The U.S. PODF Increment Manager performs these duties in accordance with this document and its annexes. The U.S. PODF Increment Manager's responsibilities include:

A. Ensuring verification of increment procedure and display compliance with safety directives.

B. Establishing schedules for each payload to support training and flight milestones, with the PD, U.S. PODF Team, the PDRP Mini-Team, and Training. These schedules account for procedure and display developer inputs, U.S. PODF Management Team review/verification activities, flight delivery milestones, and crew training milestones.

C. Maintaining status of U.S. PODF schedules and provide timely reporting of issues and risks to the U.S. PODFCB Chairperson and the Payload Management Integration Team (PMIT) for resolution.

D. Ensuring verification of increment flight procedures and displays to program standards.

E. Ensuring flight procedure and display usability for the increment.

F. Supporting the U.S. PODFCB in work flow planning and configuration control of procedures and displays for an increment.

G. Evaluating flight changes for applicability/impact to future increments and coordinate with the respective increment's manager.

H. Supporting flight activities as required to ensure correct procedures for crew use, resolution of flight issues, and integration with short term planning activities.

I. Coordinating resolution of schedule, standards, and operations issues that arise during the increment operations preparation and flight phases.

J. Integrating and delivering the U.S. PODF components for the increment as required:

(1) Crew Procedures - Electronic Format (CD-ROM)

(2) Reference Information - Electronic Format (CD-ROM)

(3) PCD Document - Electronic Format (CD-ROM) and Hardcopy

(4) PSH - Electronic Format (CD-ROM) and Hardcopy

(5) PRH - Hardcopy

(6) Procedure Support Items - Clips, Velcro, Pens, Pencils, Markers, etc.

(7) Automated Procedures - Electronic Format (Uplink to PL MDM Only)

(8) Flight Displays - Display Version or Software Load Format as required

(9) Flight Unique Items - Format as required

K. Evaluating procedure validation records for sufficiency and resolving issues with PDs and the U.S. PODFCB.

4.2.3 Responsibilities of the Procedure Subteam and PDRP

The PDRP is an implementation review panel responsible for ensuring that U.S. payload displays and IP displays in the U.S. elements possess a high degree of usability and conform to program standards. The Procedure Subteam is responsible for ensuring that U.S. payload operations procedures and reference information for payloads in the U.S. elements (or connected to U.S. elements) conform to program standards, and are in flight-load format.

4.3 RESPONSIBILITIES OF PROCEDURE AND DISPLAY DEVELOPERS

PDs include payload representatives and designated members of the POIC. The PD shall be responsible for submitting procedure and display files to the U.S. PODF through appropriate electronic transfer medium (i.e., OPMS, PIMS, fax, or other). In addition, the PD shall:

A. Be responsible for the development of the payload procedures, displays, and reference information, including their technical content and integrity. The PD shall ensure flight procedures and displays meet research requirements (i.e., shall be responsible for ensuring mission success).

B. Be responsible to the U.S. PODFCB for the technical content and integrity of PLSS procedures, LSE procedures and reference information as they relate to payload requirements.

C. Ensure that the procedures, displays, and reference information are validated and are consistent with the systems data, PLSS and LSE procedures, submitted mission planning requirements, stowage requirements, and relevant components of the U.S. PODF. (See U.S.PODF Management Plan, Annexes 3 and 5.)

D. Ensure that the procedures, displays, and reference information in the U.S. PODF file abide by the policies and guidelines published in the ODF Standards, Operations Nomenclature (Op Nom), DGCS, and U.S. PODF Management Plan.

E. Deliver the procedures, displays, and required Procedure Validation Records to the U.S. PODF Increment Manager through electronic transfer medium according to the template schedule defined by the Payload Data Set Blank Book or Payload Integration Agreement (PIA).

F. Determine the appropriate facility for the validation of a procedure or display and provide this information to the U.S. PODF Increment Manager via the Validation Plan and Records. All procedures and displays shall be validated/verified in the highest level facility practical. (See Annex 3.)

G. Verify that any procedures or displays copied from other sources are the most current.

H. Ensure that their payload procedures and displays contain all required procedural hazard controls defined in the Payload Hazard Report (PHR).

I. Determine if revalidation is required if changes are made to baselined procedures or displays. All new procedures and displays shall be validated/verified before their use in flight operations. If a procedure or display has been updated, the PD shall provide a Change Request (CR) and revalidation recommendation to the U.S. PODFCB, and the

control board must evaluate the impact of the change to determine if revalidation/reverification is required. If the procedure has undergone a significant change, it shall be revalidated/reverified. Minor or editorial changes may not require revalidation/reverification.

J. Maintain and re-deliver Procedure Validation Records and Procedure Validation Plan for review by U.S. PODF Team.

K. Support realtime procedure and display changes and new procedures generated in near-realtime.

L. Maintain and deliver Procedure Hazard Control List.

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SECTION 5, TOOLS FOR MANAGING U.S. PODF PROCEDURES AND DISPLAYS

5.1 ONLINE PROJECT MANAGEMENT SYSTEM

OPMS provides a controlled access electronic medium for PDs to deliver their procedures to the U.S. PODF. Use of OPMS provides:

A. Ability for PDs to submit/delete procedures and displays but others only read/download access.

B. Ability for members of the POIC Team to access all U.S. payload procedures and displays to verify safety, nomenclature, and standards.

C. Individual areas for each increment as well as generic and multi-increment procedure/display area that can be accessed by all (PDs can verify PLSS and LSE files).

D. Cross platform (Mac or PC) access.

E. Ability to use native format.

F. Ability for the PD to group related files within one folder (nominals, malfunctions, etc.) for one payload or experiment.

OPMS will also be used to build the U.S. PODF file. Increment files, along with associated PLSS and LSE procedures extracted from OPMS, will be published on the U.S. PODF web page at http://mole.msfc.nasa.gov/station/oc/podf-welcome.html on specific milestone dates.

5.2 PAYLOAD INFORMATION MANAGEMENT SYSTEM

The flight U.S. PODF is published electronically to PIMS. Through PIMS, all partners and users can view, print, and download the U.S. PODF. Authorized users can submit U.S. PODF ECRs or OCRs using PIMS.

All U.S. PODF products are stored and managed using the PIMS system. PIMS provides the capability to:

A. Produce text, integrated text/graphics, graphical procedures, and reference information.

B. Store and provide multiple increment/multiple version control of procedures, displays or display applications, and reference information within a single repository.

C. Provide access control to U.S. PODF products to ensure data integrity and prevent unauthorized changes.

D. Logically associate procedures, displays, and reference information into groups (referred to as U.S. PODF files) for management approval and user interface to view procedures and displays or display applications.

E. Perform desktop publishing to produce files for the production of paper U.S. PODF products.

F. Store executable compiled version of automated procedures.

G. Support processing and maintenance of procedure CRs which include pre-increment ECRs, realtime ECRs, and OCRs.

H. Implement approved changes and maintain version control within a single repository.

I. Maintain procedure validation and change history records.

J. Support approval of displays, procedures, and U.S. PODF files and maintenance of records of the approval process.

K. Perform comparison of and searches for U.S. PODF products in support of procedure and display development and configuration control.

L. Provide file sharing/transfer capability with external systems such as Electronic Documentation Project (EDP) and the Procedure Development and Control System (PDAC).

SECTION 6, GUIDELINES

Figure 6-1 shows the flow of information from payload concept to mature operations products. This flow provides a top-level view for the PD of the steps involved in the production of a good crew operations design, which is essential to mission success for the payload.

Development of the U.S. payload procedures and displays is the responsibility of each U.S. payload team. Information gathered for items in U.S. PODF source material is found in such documents as the Increment Definition and Requirements Document (IDRD), PIAs, Payload Interface Control Documents (ICD), and various data sets. These documents, for all increments available, can be located on the PALS website at http://issa-www.jsc.nasa.gov/cgi-bin/dsalt/orap?-h+palshome. The standards and guidelines for this activity are described in the following sections.

6.1 STANDARDS FOR PROCEDURE AND DISPLAY DEVELOPMENT

PDs shall adhere to the ODF Standards Document when developing flight procedures, and to the DGCS document when developing crew displays. The operations nomenclature for ISS is found in Operations Nomenclature and is applicable to procedures and displays.

6.2 U.S. PODF ADMINISTRATIVE MANAGEMENT DATA GUIDELINES

Each payload shall develop and deliver a Validation Plan. Each U.S. PODF procedure shall be delivered with an accompanying Validation Record. (A single, detailed, Validation Record can suffice for multiple related procedures, provided those procedures were validated at the same time and in the same manner, e.g., one Record might document all nominal procedures, another correctives, and so forth. However, the Record shall specify details of validation for each procedure so included.) The procedures shall be validated with their associated display(s). These items are documented and maintained in OPMS as input by the PD. The PD shall also document the purpose of each procedure, the purpose of each major procedural step, and Hazard Report Correlation in the Payload Data Set Blank Book input. This information ensures that an accurate, accountable audit trail is established for investigative purposes. The records shall be kept current for all existing procedures and shall reflect any changes to these procedures. The format for the procedure Validation Record and the Validation Plan is documented in U.S. PODF Management Plan, Annex 3, U.S. PODF Procedure Verification and Validation.

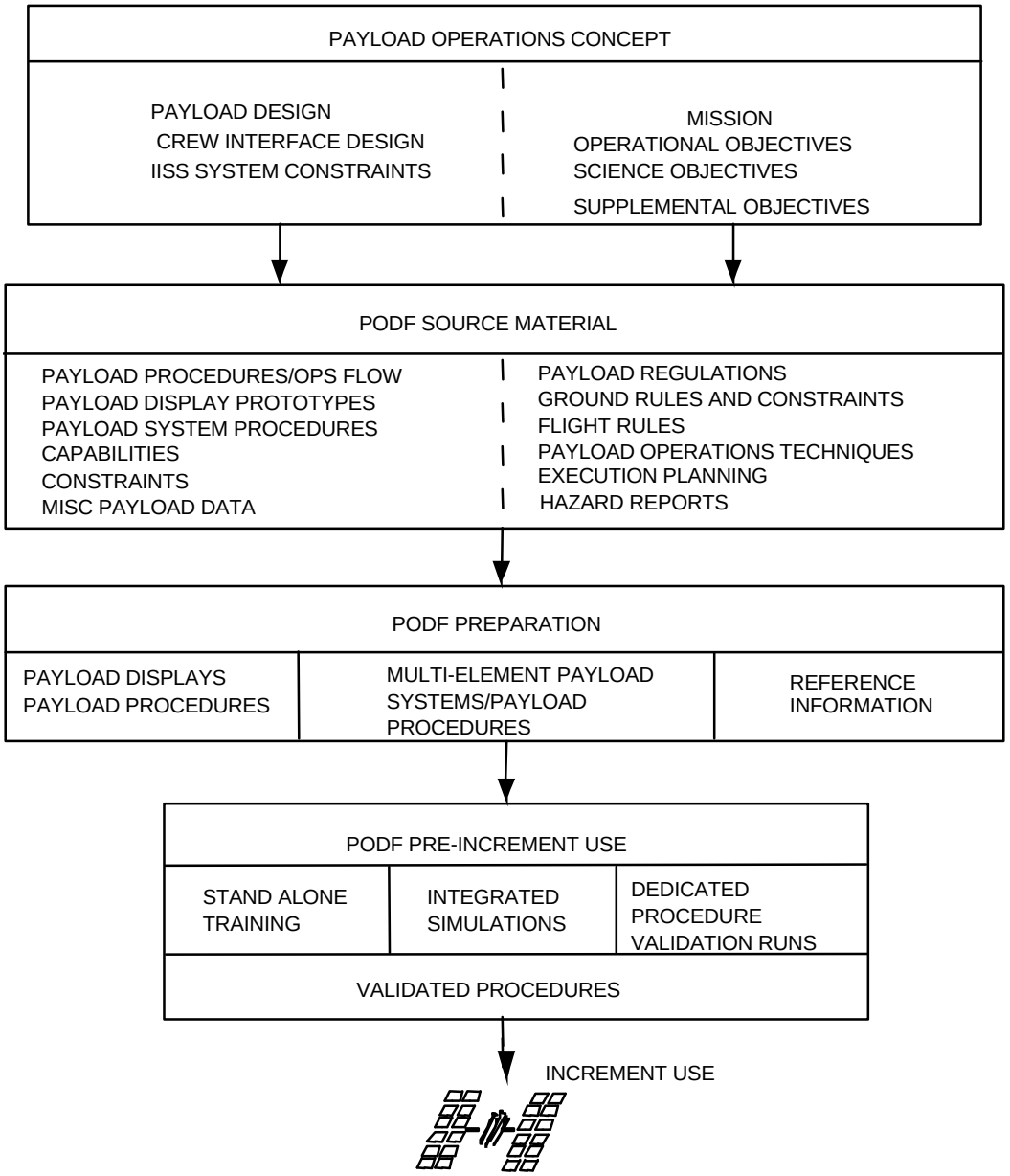

FIGURE 6-1 U.S. PODF PROCEDURE AND DISPLAY DEVELOPMENT FLOW

6.3 U.S. PODF VERIFICATION AND VALIDATION

Validation is the process by which every procedure and display included in the U.S. PODF is checked to assure that it is technically accurate (PD's responsibility), safe (POIC's responsibility), and achieves the desired results (PD's responsibility). All U.S. PODF procedures and displays shall be validated by the PD prior to submittal. The PD and the POIC are both involved in the verification of the U.S. PODF procedures. Specific responsibilities and processes are defined in U.S. PODF Management Plan, Annex 3, U.S. PODF Procedure Verification and Validation, and Annex 5, Payload Display Review Plan.

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SECTION 7, PROCESS FOR U.S. PODF MANAGEMENT

The U.S. PODF Increment Manager will manage the configuration/version, provide access, coordinate POIC review, and assure the publication of the U.S. PODF. The development and submittal of the payload procedures and displays shall be the responsibility of the PD. The development and submittal of the PLSS, LSE procedures and displays, and payload C&DH documentation are the responsibility of the POIC. Approval in PIMS (currently OPMS) of payload documents, with e-mail announcing availability, and publication on the U.S. PODF web page is the responsibility of the POIC and U.S. PODF Increment Manager. Hardcopies of payload documentation that will be supplied to the crew on board will be the responsibility of the U.S. PODF Fabrication Facility for assembly and publication. For an overview of the process, see Figure 1-1 of this document.

7.1 U.S. PODF CONFIGURATION CONTROL

A formal configuration/version control process for the U.S. PODF is managed by the U.S. PODFCB Chairperson and documented in the U.S. PODF Management Plan, Annex 2, U.S. PODF Configuration Control, and U.S. PODF Payload Display Review Plan, Annex 5. Formal configuration control of payload and payload system procedures will begin with the submittal of the ~~baseline~~ Final version of the U.S. PODF. The configuration control process will use an ECR form to document and track changes to ~~baselined~~ the Final procedures and displays. Procedure issues that cannot be resolved by the U.S. PODFCB may be appealed to the ODFCB.

Formal version control of payload displays will begin after displays have been certified as ready for training and flight by the PDRP. Display issues that cannot be resolved by the U.S. PODFCB may be appealed to the PCB.

All ECRs initiated against a U.S. payload procedure or display under configuration control must be dispositioned by the U.S. PODFCB. The U.S. PODFCB determines the appropriate reviews for each ECR and maintains an ECR tracking system. The U.S. PODFCB conducts meetings for the purpose of reviewing ECRs. ECRs that meet the following criteria are candidates for review by the entire U.S. PODFCB:

A. Involve crew safety.

B. Propose the addition or deletion of technically significant procedures, displays, or data.

C. Involve significant technical updates to existing procedures and displays.

D. Alter the implementation of Flight Rules or Payload Regulations.

E. Are delinquent (have been in the configuration management system for more than 30 working days).

7.2 U.S. PODF ACCESS

The flight U.S. PODF for each increment will be maintained in PIMS when available; until then they will reside in the OPMS and will be published on the U.S. PODF web page http://mole.msfc.nasa.gov/ station/oc/podf-welcome.html. Displays, or screen shots of displays, will be published on the PDRP web page (http://mole.msfc.nasa.gov/pdrp), in coordination with the PD. (To prevent, e.g., unwanted disclosure or proprietary material, the decision may be jointly made to forego publishing.) PIMS can be accessed using Enhanced HOSC System (EHS) workstations in the POIC and through any EHS workstation at remote locations. The U.S. PODF is available for viewing by external organizations in PIMS/OPMS via a web interface. Other entry points will be through the U.S. PODF and PDRP web pages.

7.3 U.S. PODF PROCEDURE PUBLICATION TEMPLATE

U.S. PODF procedure files are published in two major releases: ~~Preliminary~~ Basic and ~~Baseline~~Final. The publication release dates apply for both the electronic and paper portions of the U.S. PODF procedures. The U.S. PODF procedures are published and distributed primarily in electronic format using PIMS (OPMS web access and the U.S. PODF web page http://mole.msfc.nasa.gov/station/oc/podf-welcome.html). This includes electronic versions of procedure products that will be available as paper (hardcopy) on board ISS. Table 7-I shows the generic template that PDs follow when delivering procedure inputs to PIMS (or OPMS). The generic template for U.S. PODF publications is shown in Table 7-II.

TABLE 7-I U.S. PODF USER INPUT TEMPLATE FOR PROCEDURES

INCREMENT	USER INPUT TO U.S. PODF FOR ~~DRAFT~~ PRELIMINARY	USER INPUT TO U.S. PODF FOR ~~PREL~~ BASIC and ETOV OPS INPUT FOR BASIC	USER INPUT FOR ETOV OPS ~~BASIC~~FINAL	USER INPUT TO U.S. PODF FOR ~~BASELINE~~ FINAL	FINAL ECR CUTOFF (PD INPUT)
I2 thru In	*I- 19 months*	*I- 16 months*	*I- 8 months*	*I- 7 months*	*I- 4 months*

TABLE 7-II U.S. PODF PROCEDURE PUBLICATION TEMPLATE

INCREMENT	~~PRELIMINARY~~BASIC PUBLICATION (NLT; accommodates post-PTDR changes)	U.S. PODF ~~INPUT FOR~~ ETOV OPS PRELIMINARY~~;~~ ~~U.S. PODF INPUT TO U.S. SODF PRELIMINARY~~	U.S. PODF ~~INPUT FOR~~ ETOV OPS BASIC~~;~~ ~~U.S. PODF INPUT TO U.S. SODF BASIC~~	FINAL U.S. PODF ~~BASELINE~~ PUBLICATION	U.S. PODF ~~INPUT FOR~~ ETOV OPS FINAL~~;~~ ~~U.S. PODF INPUT TO U.S. SODF FINAL~~	INCORPORATION OF APPROVED ECRS INTO FLIGHT LOAD
I2 thru In	*I- 13 months*	*I- 13 months*	*I- 7 months*	*I- 4.5 months*	*I- 3 months*	*I- 1.5 months*

The U.S. PODF Increment Manager develops and maintains an increment-specific schedule that will replace the increment-minus dates from the generic template with actual dates. In general, the goal is to have technically accurate and verified procedures at the start of crew training Increment minus (I-) 12 months and for flight. If necessary, these dates may be negotiated with the U.S. PODF Increment Manager, who coordinates between the PD, procedure POC, the PDRP, the PMIT, the Increment Lead Payload Operations Director (POD), the Payload Integration Manager (PIM), and Training. If agreement cannot be reached, the U.S. PODF Increment Manager will take the issue to the U.S. PODFCB Chairperson for resolution. A more detailed description of the publication cycles, including distribution, is included in the U.S. PODF Management Plan, Annex 4, U.S. PODF Preparation and Publication Plan.

7.3.1 ~~Draft~~ Preliminary Release of a Procedure

The release of the ~~draft~~ Preliminary version of a procedure will:

A. Provide visibility into payload procedure development and into PLSS/LSE equipment procedures development.

B. Support PDRP mini-team usability assessments with displays. (Annex 5 provides details.)

C. Support pre-ship simulator test for training.

D. Allow initial evaluation of planned operational hazard control implementation.

E. Support PDRP review of Static Displays.

F. Support crew training lesson development.

~~Draft~~ Preliminary versions of procedures will not be reviewed for standards compliance. They shall reside in the OPMS system.

7.3.2 ~~Preliminary~~ Basic Publication of a Procedure

The publication of the ~~preliminary~~ Basic version of a procedure will:

A. Provide a review of the procedure's use of ODF standards and operations nomenclature conformance.

B. Support the Payload Training Dry Run (PTDR).

C. Support the IORR (Increment Operations Readiness Review) which is a PODF review for Payload and ISS system interfaces and the IFOR (Increment Flight Operations Review) which assesses the preparation and status of the execute operations.

~~C.~~D. Determine impacts to payload training, payload systems training, and integrated operations training.

~~D.~~E. Determine impacts to Station PLSS, resources, integrated flight operations, and ground operations.

~~E.~~F. Be used for the planning of fabricating the physical products.

~~F.~~G. Allow evaluation of planned operational hazard control implementation.

The ~~Preliminary~~ Basic publication of the U.S. PODF procedures is timed to coincide with the beginning of the payload training process. It is a release of procedures that have been approved for technical content by the PD and approved for safety compliance, noninterference with other payloads, and compliance with standards and compatibility with crew displays by the POIC Team. Following the release of the ~~Preliminary~~ Basic procedures, the increment U.S. PODF resides in the OPMS system and on the U.S. PODF web page (http://mole.msfc.nasa.gov/station/oc/podf-welcome.html), and is available to the operations community for review and use in the training process.

7.3.3 Earth-To-Orbit Vehicle (ETOV) Ops ~~Preliminary and Basic~~Basic and Final Publications

These user inputs at I-16 and I-8 months are published by U.S. PODF at I-13 and I-7 months, respectively. This is to support ETOV transfer procedures, which JSC publishes at I-12 months for Preliminary, and I-6 months for Baseline. This allows time for them to be inserted into the U.S. SODF, as well as the FDF, in time for the appropriate Orbiter transfer flight.

7.3.4 ~~Baseline~~ Final Publication of the U.S. PODF

Publication of the ~~baseline~~ Final version of the U.S. PODF at ~~I-6~~I-4.5 months will:

A. Provide a program-wide review of the payload procedures and PLSS procedures.

B. Establish configuration control of each component.

C. Provide one consistent set of procedures for community review.

D. Provide one consistent set of procedures for use in testing and training.

E. Be used for the fabrication of the physical products.

The ~~baseline~~ Final publication of the U.S. PODF coincides with crew proficiency training, generic integrated training, and the delivery of an increment-specific training load to the Space Station Training Facility (SSTF).

Following the ~~baseline~~ Final publication, U.S. PODF files are under configuration control, and changes may only be made using the official change process which is defined in U.S. PODF Management Plan, Annex 2, U.S. PODF Configuration Control.

7.3.5 Final ECR Updates of the U.S. PODF & U.S. SODF

The U.S. PODF and U.S. SODF (including ETOV) may be updated via ECR submitted not later than I-4 months. The changes to the U.S. SODF and ETOV will be forwarded to JSC by I-3 months. The ensuing changes to the U.S. PODF will be published at I-1.5 months, and would:

A. Be built from the baseline version with the implementation of approved change requests (ECR).

B. Be used for the fabrication of the physical products in time for transporting to the launch site.

C. Support the U.S. PODF certification process.

This publication supports increment-specific Joint Multi-Segment Training (JMST). The publication represents procedures approved by the operations community which have been through the complete procedure verification/validation process and are ready to support the increment. After ~~baselining of~~ issuing the Final ~~increment~~ U.S. PODF files for the increment, changes to ~~increment U.S. PODF~~these procedures may continue to be made using the official change process: ECR until I-4 months, OCR thereafter. If a generic procedure remains unchanged from one increment to another, it remains under configuration control. During this time the U.S. PODF remains available to the operations community for review as discussed in U.S. PODF Management Plan, Annex 2, U.S. PODF Configuration Control.

7.3.6 ~~Baselined~~ Final U.S. PODF Procedure Files

As the ISS payloads and payload systems mature, U.S. PODF procedures will be maintained under continuous configuration control as a baseline file. The baseline file is managed by the U.S. PODFCB. All changes made to baselined procedures shall be made using the official change process documented in Section 7.1 of this management plan. The PD shall continuously update baselined procedures as changes or revisions are required and approved.

7.4 U.S. PODF DISPLAYS TEMPLATE

The PD shall manage the configuration of, provide access to, and assure the delivery of the on-board displays sent to the U.S. PODF Team and to the Facility Integration Team. The activities of the PDRP and of the PD are documented in the U.S. PODF Management Plan, Annex 5, Payload Display Review Plan, and in the U.S. PODF Management Plan, Annex 6, Payload Display Developers Guide. Table 7-III shows PD display inputs to PIMS (or OPMS).

TABLE 7-III U.S. PODF USER INPUT TEMPLATE FOR DISPLAYS

INCREMENT	USER INPUT TO PDL FOR CONTACT INFORMATION	USER INPUT TO U.S. PODF FOR OPERATIONAL CONCEPTS	USER INPUT TO U.S. PODF FOR PRELIMINARY DISPLAYS	USER INPUT TO U.S. PODF FOR FINAL DISPLAYS
I2 thru In	*I- 22 months*	*I- 21 months*	*I- 19 months*	*I- 16 months*

The U.S. PODF Increment Manager develops and maintains an increment-specific schedule that will replace the increment-minus dates from the generic template with actual dates. In general, the goal is to have technically accurate and verified displays at the start of crew training (I-12) and for flight. A more detailed description of the display verification process is found in the U.S. PODF Management Plan, Annex 5, Payload Display Review Plan.

7.5 U.S. PODF CERTIFICATION

Certification by the U.S. PODFCB is the act of declaring the U.S. PODF ready for operational use.

7.5.1 U.S. PODF Procedures Certification

The U.S. PODFCB Chairperson will certify the U.S. PODF procedures when the following conditions have been met:

A. A final version of each procedure has been published.

B. All procedures have been validated by the PD/PI and signed originals of the Procedure Validation (PV) Plan and PV Records are received by the U.S. PODF Increment Manager.

C. All approved ECRs have been implemented.

D. U.S. PODF physical products are on schedule for delivery to the launch site.

E. All procedure hazard controls have been properly implemented.

F. NASA Certification Criteria and Station-wide Certification Criteria (where applicable), per Payload Regulations, have been met.

If the procedures for a payload are not ready, then the payload can be declared not operational. If this occurs, its procedures will be removed from the U.S. PODF via the ECR process.

The U.S. PODF Increment Manager reports the certification readiness status of the U.S. PODF procedures to the U.S. PODFCB. The U.S. PODFCB in turn reports the U.S. PODF procedures certification status to the ODFCB via the U.S. PODFCB Representative to the ODFCB and to the POD for inclusion in the Payload Operations Certification of Flight Readiness (CoFR).

7.5.2 U.S. PODF Displays Certification

The U.S. PODFCB Chairperson will certify the U.S. PODF displays when the following conditions have been met:

A. The PD has incorporated changes required by the PDRP Chairperson into the final version of each display file.

B. The final version of the display file has been baselined by the PD.

C. All approved ECRs have been implemented.

If the displays for a payload are not ready, then the payload can be declared not operational. If this occurs, its displays will be removed from the U.S. PODF via the ECR process.

The U.S. PODF Increment Manager reports the certification status of the U.S. PODF displays to the U.S. PODFCB. The U.S. PODFCB in turn reports the U.S. PODF displays certification status to the ODFCB via the U.S. PODFCB Representative to the ODFCB and to the POD for inclusion in the CoFR.

7.6 REALTIME PROCEDURES MANAGEMENT

The POIC will develop a File Uplink Plan that includes the U.S. PODF automated procedures for a selected timeframe, and the plan for incorporating any changes. The File Uplink Plan (File Ground Management Tool Schedule) is updated as often as needed to ensure the necessary automated procedures are available on board when needed.

The File Uplink Plan contains the necessary information to determine bandwidth allocations needed to support transmission of the procedure file. This information includes:

A. The timeframe the file is needed on board.

B. Size of the file.

C. Any special characteristics of the data.

D. The location of the files on the ground (PIMS).

Manual procedures will be delivered electronically to the MCC-H for uplink via Orbital Communications Adapter (OCA). The specific uplink roles and responsibilities for uplinking to the on-board U.S. PODF are described in the appropriate POIF documentation.

Only procedures that have been approved through the realtime configuration management process (PIMS OCR System) are eligible for uplink. The OCR constitutes a temporary change to the ~~Baselined~~ Final ground and flight version of the U.S. PODF. A permanent change must be instigated by an ECR. If an ECR is generated during an increment, a parallel OCR is developed to accomplish its realtime implementation. Both processes are discussed in the U.S. PODF Management Plan, Annex 2, U.S. PODF Configuration Control.

7.7 U.S. PODF SAFETY VERIFICATION

Safety verification for operational controls is a U.S. PODF procedure management process that deserves special attention due to its importance to the program. Safety of crew and vehicle is the most important objective of the ISS program. Through the U.S. PODF management process, safety verification of payload procedures is performed. The POIC has overall responsibility for “payload” safety on board the ISS. The PD is responsible for accessing the applicable payload hazard reports, incorporating all procedural hazard controls, and developing and maintaining the Procedure Hazard Control List, which identifies the location of each procedural hazard control. Preflight, POIC Safety performs an independent verification that all operational hazard controls are properly implemented in procedures.

Safety verification activity will apply to preflight procedures, as well as to the flight procedures and any updates to them. A more in-depth discussion of safety verification will be/is addressed in the U.S. PODF Management Plan, Annex 3, U.S. PODF Procedures Verification and Validation.

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SECTION 8, PROCEDURE RESIDENCY GUIDELINES

8.1 U.S. PODF/U.S. SODF/FDF GUIDELINES FOR PROCEDURES

Table 8-I gives the guidelines that have been defined for determining whether a procedure will reside in the U.S. PODF, U.S. SODF, or the FDF.

In cases where these guidelines do not suffice, a decision on procedure residency will be made on a case-by-case basis. Those procedures required by the FDF shall follow the standard FDF input philosophy. The U.S. PODF Increment Manager will take the inputs from PDs which go to the FDF (and U.S. SODF as well) and coordinate and deliver those items as appropriate.

TABLE 8-I RESIDENCY GUIDELINES FOR PROCEDURES

	FDF	SODF (or EODF or RODF or JODF)	PODF
Systems ISPR		Removal from MPLM Transfer, Installation, Activation & C/O of Rack System Checkout & Activation , Nom, Mal, etc.	May contain some nominal operating procedures in accordance with MOD/FPD MOU
Payload ISPR N/A for IPs		Rack Removal from MPLM Transfer, Installation, Visual Verification	Payload Activation & Checkout, Nom, Mal, etc.
Middeck Payloads N/A for IPs		Transport operations/ Removal from Shuttle middeck, transfer in Ass'y Ops C/L	Install into Rack Payload Checkout & Activation, Nom, Mal, De-install, etc.
Powered Middeck Payloads	Transport operations (prior to transfer) in PL Ops C/L	Powered Transfer procedures include power-down on shuttle, physical removal, transfer, installation, & power-up to survival state on ISS (& vice-versa for de-installation) in PL Ops tab of Ass'y Ops C/L	~Activation/initialization, Nom, Mal, etc.
EXPRESS Payloads		Removal from MPLM, Transfer to U.S. Lab EXPRESS Rack transfer procedure includes all steps for rack transfer including prep work, transfer, installation, etc.	Install into EXPRESS Rack Payload Checkout & Activation , Nom, Mal, etc.
EXPRESS Rack N/A for IPs		Removal from MPLM Transfer, Installation, and Interface Verification	EXPRESS Rack, Activation, Checkout, Nom, Mal, etc.
EXPRESS Pallet N/A for IPs	Removal from PL Bay if done with STS RMS	EXPRESS Pallet installation & Interface Verification once handed over to SSRMS	EXPRESS Pallet Activation, checkout, Nom, Mal
EXPRESS Pallet Payloads	Removal from PL Bay if done with STS RMS	Payload installation on EXPRESS Pallet & interface verification once handed over to SSRMS	Payload Activation, Checkout, Nom, Mal
Attached Truss and Freeflyer Payloads	Removal from PL Bay if done with STS RMS	Truss installation, & Interface verification once handed over to SSRMS	Payload Activation, Checkout, Nom, Mal
Integrated Stowage Rack or Aisle Stowage		Removal from MPLM Transfer, Installation	Special configuration or arrangement within rack on-orbit
Individual Stowage Lockers		Removal from MPLM Transfer, Installation, Systems stowage items usage	Payload Stowage items usage

SECTION 9, U.S. PODFCB BUSINESS RULES

9.1 MEETING SCHEDULES AND AGENDAS

The U.S. PODFCB meets on a regular basis to address those procedure- and display-related issues brought forward by the operations community, U.S. PODFCB members, or the PDs. Issues for multiple increments are addressed at a single meeting. The originators of each issue shall be responsible for submitting agenda items to the U.S. PODF Increment Manager for scheduling at a particular U.S. PODFCB meeting.

9.2 MINUTES

Minutes of the U.S. PODFCB meetings are provided to the U.S. PODFCB members within five (5) working days following a meeting. A database documenting the resolution of the ECRs is available on the POIC web page http://mole.msfc.nasa.gov/station/.

9.3 ACTION ITEM TRACKING

Action items are assigned, along with a date at which the assignee is expected to return to the U.S. PODFCB with a proposal for resolution. The action item assignee shall be responsible for reporting to the U.S. PODFCB secretary the status of the action item, and assuring that the action item is scheduled on the agenda at the appropriate time. Action items may also be assigned to complete U.S. PODF development work, such as PDs updating procedures with comments, or a U.S. PODF Increment Manager developing the paper products. The actionee shall be responsible to status completion to the U.S. PODFCB.

9.4 CR REVIEW PROCESS

Distribution of an ECR for review is the responsibility of the U.S. PODFCB Chairperson. The minimum set of reviewers for a CR is documented in the U.S. PODF Management Plan, Annex 2, U.S. PODF Configuration Control.

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APPENDIX A

ABBREVIATIONS AND ACRONYMS

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A, ABBREVIATIONS AND ACRONYMS

AFD	Aft Flight Deck
AIT	Analysis and Integration Team
APV	Automated Procedure Viewer
ASI	Agenzia Spaziale Italiana
C&DH	Command and Data Handling
CD	Compact Disk
CDR	Critical Design Review
CoFR	Certification of Flight Readiness
CR	Change Request
CSA	Canadian Space Agency
DGCS	Display and Graphic Commonality Standards
ECR	Engineering Change Request
EDP	Electronic Documentation Project
EHS	Enhanced HOSC System
ESA	European Space Agency
ETO	Earth-To-Orbit
ETOV	Earth-To-Orbit Vehicle
EXPRESS	EXpedite the PRocessing of Experiments to Space Station
FD	Flight Director
FDF	Flight Data File
FDFCB	Flight Data File Control Board
FIDR	Final Interim Design Review
FPD	Flight Projects Directorate
GFE	Government-Furnished Equipment
HCI	Human Computer Interface
I	Increment
I-	Increment minus
ICD	Interface Control Document
IDAGS	Integrated Display And Graphics Standards
IDR	In-Process Design Review
IDRD	Increment Definition and Requirements Document

IP	International Partner
IP&CL	Instrumentation Program and Command List
ISPR	International Standard Payload Rack
ISS	International Space Station
ISSP	International Space Station Program
JEM	Japanese Experiment Module
JMIT	Joint Multi-Segment Integrated Training
JMST	Joint Multi-Segment Training
JSC	Johnson Space Center
KSC	Kennedy Space Center
L	Launch
L-	Launch minus
LSE	Laboratory Support Equipment
Mals	Malfunction Procedures
MBF	Mission Build Facility
MCC	Mission Control Center
MCC-H	Mission Control Center - Houston
MOD	Mission Operations Directorate (JSC)
MOU	Memorandum Of Understanding
MPLM	Multi-Purpose Logistics Module
MPV	Manual Procedure Viewer
MSFC	Marshall Space Flight Center
NASA	National Aeronautics and Space Administration
NASDA	National Space Development Agency of Japan
OC	Operations Control
OCA	Orbital Communications Adapter
OCR	Operations Change Request
ODF	Operations Data File
ODFCB	Operations Data File Control Board
OPMS	Online Project Management System
Op Nom	Operations Nomenclature document
OPS-LAN	Operations Local Area Network
PALS	Program Automated Library System
PCB	Payload Control Board
PCD	(U.S.) PODF Contents Definition (document)

PCS	Portable Computer System
PD	Payload Developer
PDAC	Procedure Development and Control System
PDL	Payload Data Library
PDRP	Payload Display Review Panel
PDSBB	Payload Data Set Blank Book
PG	Product Group
PHR	Payload Hazard Report
PI	Principal Investigator
PIA	Payload Integration Agreement
PIM	Payload Integration Manager
PIMS	Payload Information Management System
PL	Payload
PL MDM	Payload Multiplexor/Demultiplexor
PLSS	Payload Support System
PMIT	Payload Mission Integration Team
PMO	Procedures Management Organization/Office
POC	Point of Contact
POD	Payload Operations Director
PODF	Payload Operations Data File
PODFCB	Payload Operations Data File Control Board
POIC	Payload Operations Integration Center
POIF	Payload Operations Integration Function
PRH	Payload Reference Handbook
PSH	Payload Systems Handbook
PSIV	Payload Software Integration Verification
PSOP	Payload System Operating Procedures
PSRP	Payload Safety Review Panel
PTDR	Payload Training Dry Run
PV	Procedures Validation
RMS	Remote Manipulator System
ROM	Read Only Memory
RSA	Russian Space Agency
SODF	Systems Operations Data File
SOP	Standard Operating Procedures
SSC	Station Support Computer
SSP	Space Shuttle Program
SSRMS	Space Station Remote Manipulator System
SSTF	Space Station Training Facility
STS	Space Transportation System

SVMF	Space Vehicle Mockup Facility
TBD	To Be Determined
TBR	To Be Resolved
U.S.	United States
U.S. PODF	United States Payload Operations Data File
U.S. PODFCB	United States Payload Operations Data File Control Board
U.S. SODF	United States Systems Operations Data File
U.S. SODFCB	United States Systems Operations Data File Control Board

APPENDIX B

GLOSSARY OF TERMS

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B, GLOSSARY OF TERMS

Activity - A set of data associated with a procedure that allows it to be scheduled based on Station configuration (e.g., resource requirement, temporal relations, constraints, etc.)

Approved Procedures - Procedures that cannot be altered except through a formal documented process (e.g., change request), also referred to as being baselined.

Assembly Procedure - Station procedures involving assembly, activation, checkout, and on-board validation of the Station elements.

Audit Trail - Paper or electronic documentation trail representing the history of a procedure (i.e., how it got from its original form into the current edition). An audit trail is also applicable in describing the historical origins of a parametric data source and any processing that was done to the data to arrive at its present form.

Authoritative Document - A document that is under formal change control and is used to directly support flight operations.

Automated Procedure - Procedures that are developed to be executed by the on-board procedure executor software. The crew can step through, interrupt execution, or skip portions of the automated procedure.

Baseline File - The Baseline File contains procedures which are used from increment to increment. The procedures and reference information contained therein are usually independent of flight-unique aspects such as Station assembly phase, trajectory, or flight-specific payload requirements.

Change Request - Official request to change a controlled U.S. PODF procedure containing information required to add, delete, or modify an item in the U.S. PODF (e.g., procedure, object, display); includes, at a minimum, a description of and reason(s) for change, the individual(s) requesting the change. CRs are either pre-flight (ECR) or realtime temporary changes (OCR). They are either entered directly into PDAC or submitted to the Procedures Management Organization/Office (PMO) and processed by the U.S. PODFCB.

Checklist Procedures - Textual collection of sequential actions. Step-by-step instructions requiring little or no branching.

Command - Action to be completed in support of an on-orbit task. In realtime, this action may be completed by crewmembers or ground controllers and can be accomplished manually, interactively, or via computer.

Configuration Control - The processes and policies associated with the management and coordination of contents of the U.S. PODF that have been approved for use in operations.

Context of Use - Consists of the crewmembers, goals, tasks, equipment (hardware, software, and materials) and the physical and social environments in which a product is used.

Control Board - An assembly of responsible persons identified by specific boards that approves common policies, protocols, and products and discusses and resolves issues related to those areas.

Critical Equipment - Systems hardware, software, or expandables necessary to sustain crewmembers' lives and viable operation of the Station.

Cross-Reference - An integral component of U.S. PODF File XYZ's PV Records which documents every other U.S. PODF procedure that references procedures of File XYZ and every other U.S. PODF procedure that the procedures of File XYZ reference. The purpose of this is to show that the referenced information has been verified and that the information itself is available.

Cue Card - Non-electronic form of a procedure or reference information that is in an abbreviated format.

Decal - Procedure or procedures affixed to a structure at a location where a repetitive task (such as a hatch opening) is performed. Decals are also used to present information other than that directly related to a specific procedure (e.g., equipment identification).

Desktop Validation - Validation review in which the procedures are tested for technical content in an office environment.

Display - The means by which the crewmember obtains payload status from and sends commands to a payload and payload support systems via a laptop or front panel visual interface, i.e., the means to control payload operations.

Effectiveness - The accuracy and completeness with which crewmembers acceptably implement required functions.

Efficiency - The relationship between the resources expended and the accuracy and completeness with which crewmembers implement functions.

Electronic Documentation Project - A JSC software system used to view the U.S. SODF on console and in the office. The EDP workflow system is used for electronic creation and distribution of CRs to the U.S. SODF.

Element - All on-orbit hardware and software belonging to a Space Station partner.

Engineering Change Request - Official request to change a controlled U.S. PODF procedure containing information required to add, delete, or modify and item in the U.S. PODF (e.g. procedure, object, display); includes, at a minimum, a description of and reason(s) for change, the individual(s) requesting the change. They are entered directly into PIMS.

European Space Agency - International organization acting on behalf of its member states (Belgium, Denmark, France, Germany, the Netherlands, Spain, Sweden, Switzerland, and the United Kingdom). ESA directs the European industrial team responsible for the development and manufacture of the Columbus Attached Pressurized Module.

Facility - Physical location, such as a building or room, consisting of computer-driven simulators and/or mockups which are used for crew training, hardware and software development, and procedure development and validation.

Failure - Inability of a system, subsystem, component, or part to perform its designated/required function within specified limits, under specified conditions for a specified duration.

Fidelity - Accuracy with which a training/development facility can simulate an on-orbit environment for the purpose of training and/or procedure development/validation.

File - Logical grouping of procedures and associated reference information in the U.S. PODF. Files are divided into sections (e.g., operations, malfunction, quick-response) and are similar to FDF books of the Space Shuttle program.

Flight Crew - Prime group of astronaut personnel assigned to a specific Space Shuttle flight or ISS increment.

Flight Data File - Total on-board complement of documentation and related aids available to the crew of the Space Shuttle for flight execution.

Flight Director (FD) - The lead for the ISS mission control team who has the responsibilities for realtime implementation of operations within the framework of the ISS mission rules during all phases of Station configuration.

Flight-Unique Items - Any items not usually carried, but necessary for a payload on a given flight or increment, such as display overlays, unique information-capturing devices, etc.

Ground Procedure - Procedures used by ground controllers to operate and maintain Station systems, payloads, and attached vehicles under both nominal and off-nominal conditions.

Hardcopy - Procedure or associated reference information that will exist on board ISS in a paper form as a backup to the electronic procedure or associated reference information.

Hazard - The presence of a potential risk situation caused by an unsafe act or condition (SSP 41000, ISS System Specification).

Hazard Control - Design or operational features used to reduce the likelihood of occurrence of a hazardous effect. Hazard controls are implemented in the following order of precedence (SSP 41000, ISS System Specification).

A. Elimination of hazards by removal of hazardous sources and operations by appropriate design measures.

B. Prevention of hazards through the use of safety devices or features.

C. Control of hazards through the use of warning devices.

D. Special procedures, and/or emergency devices.

E. Minimizing of hazards through a maintainability program and adherence to adequate maintenance and repair schedule(s).

Increment - Mission planning element, comprising all operations during the interval between two designated (not necessarily consecutive) Earth-To-Orbit (ETO) vehicle arrivals at the Space Station and all pre-launch planning and preparatory activities associated with this time period. For U.S. PODF purposes, this will generally be from crew launch to crew launch.

Increment U.S. PODF Structure Sheet - Specifies the procedures and associated reference information of an associated increment U.S. PODF required for the successful execution of an increment. Each increment U.S. PODF has one and only one structure sheet. Information included in the structure sheet may include a list of applicable procedure identification, responsible file manager, procedure milestone dates, and PV status.

Instruction - A preset sequence of actions.

Integrated Payload/PLSS Procedures - Procedures requiring the use of both payload and PLSS procedural steps or sequences to achieve a desired objective, with the exception

of those payload procedures involving only the basic payload support for power supply, data handling, or thermal control.

Integrated Station Procedures - Integrated Station Procedures are defined as non-assembly related procedures which require the use of multiple-system and/or system/payload procedural steps or sequences to achieve a desired objective, with the exception of those involving only the basic systems support for power supply, data handling, or thermal control. An integrated Station procedure has one or both of the following characteristics:

A. The individual system procedures are sequence-critical and/or time-critical with each other. For the result of the collective activities to be successful, the crew and/or ground controllers must perform the activities in a certain order or within a certain amount of time.

B. The system procedures correspond to individual activities that involve different systems, but it is easier to group the activities as one task rather than as multiple tasks. Easier means either (a) it is easier for the person executing the procedure to follow one procedure rather than executing different procedures to perform the activities; or (b) it is easier for the planners to plan the activities with one integrated procedure rather than multiple system procedures.

Integrated Systems Procedures - A procedure containing steps that involve operations of more than one system within an element. Integrated systems procedures are a subset of single element procedures.

Integrated System/Payload Procedures - Procedure requiring the use of both systems and payloads procedural steps or sequences to achieve a desired objective, with the exception of those payload procedures involving only the basic systems support for power supply, data handling, or thermal control.

International Partners - International participants in the ISS program. Includes National Aeronautics and Space Administration (NASA) of the United States, NASDA, the CSA, the RSA, and the ESA.

Japanese Experiment Module (JEM) - Module package to be provided by NASDA as part of ISS. This package consists of a pressurized experiments module, a logistics module, an exposure platform, and a manipulator arm.

Joint Systems and Payload Procedures - Procedures that involve coordinated operation of Space Station systems and Space Station payloads.

Joint Multi-Segment Integrated Training (JMIT) - Training configuration which involves facilities at more than one center and includes one or more control centers.

Maintenance - Function of keeping ISS systems or payloads in, or restoring them to, operational conditions. Maintenance may be crew hands-on or computer system initiated (via displays).

Maintenance Procedures - Procedures used to maintain systems, subsystems or payloads operational. Includes activities such as filter changeout/cleaning and load cycling. Maintenance procedures may be crew hands-on or executed via displays. These are generally categorized with nominal procedures.

Malfunction Procedures - Procedure used to cope with a system or equipment failure that requires a diagnostic process to determine the nature of the failure, possible corrective action, and, if normal conditions cannot be restored, the extent of degradation and the effects on subsequent operations.

Manual Execution - Execution technique in which a command is executed manually (e.g., opening a hatch by hand rather than opening it automatically).

Manual Procedure - A procedure that is viewed and executed, step-by-step, by the crew or ground controllers. The execution may be physical (open hatch) or by controlling on-orbit systems through displays (such as setting time).

Manual Procedure Viewer - Software package designed to provide a consistent presentation of procedures to crew, ground and PDs.

Media - Means of communicating procedures or reference information to the crew on board the ISS. Consists of electronic, paper books and checklists, cue cards, and decals.

Mission Build Facility (MBF) Standard Output - The electronic delivery mechanism for all the U.S. on-orbit element generated and interfacing signals and all ISS flight software. The Standard Output is assembled from several data sources:

A. The Product Groups (PG) in the form of Instrumentation Program and Command List (IP&CL) data deliveries

B. The PGs in the form of flight software and related data files as defined in the Prime Delivery Item List

C. IP&CL data and flight software from the Prime C&C developer (as integrated with MOD/SMC, TIMELINER, OUI, PCS, and IP data and flight software)

D. Government-Furnished Equipment (GFE), Shuttle interface data, payload data, and IP data

Mission Control Center - Houston - The primary U.S. facility used to monitor and control the operations of the Space Shuttle during integrated simulations and realtime. In addition, the facility may also be utilized for the validation of STS/ISS integrated operations procedures.

Multi-Element Procedures - ODF procedures involving steps that utilize Space Station systems in more than one element.

Multi-Element Systems Procedures - Procedures that involve the coordinated operation of Station systems in more than one element.

Nominal Operations - That portion of the on-orbit operations during which planned activities are carried out free from the influence of Shuttle arrival or departure or from malfunctions and failures. Can also be described as procedures used to carry out the day-to-day operation of the systems or individual subsystem or payload components.

ODF Component - The set of procedures controlled by each of the partner control boards that are chartered under the ODFCB.

ODF Procedure - A set of instructions used by ground controllers, the on-board crew, and the on-orbit procedures executor software to fulfill specific tasks needed to operate and maintain Station systems, payloads, and approaching and attached vehicles under both nominal and off-nominal conditions.

Off-Nominal Procedures - Procedures used in the event of a failure or anomaly in the nominal operation of the system or subsystem components. Procedures are normally to be accomplished within 5 minutes to prevent propagation of the failures to other systems and/or components, prevent catastrophic events by safing the system for later troubleshooting, or to bypass a failure and continue system operation.

Office of Primary Responsibility - Organization identified as being responsible for the development, production, distribution, and management of a particular checklist or file. The responsible organization assigns files to the file managers and approves the files and associated reference information and records contained in them.

Operations - Day-to-day sequences of activities associated with systems, processes, experiments, and payloads on board the ISS or on the ground in support of the on-board activities.

Operations Data File - The ODF is the collection of procedures and reference information that support Space Station on-board operations. These procedures are used by ground

controllers, the on-board crew and the on-orbit procedures executor software to operate and maintain Station systems, payloads and attached vehicles under both nominal and off-nominal conditions. The ODF has the following components: CSA Payload Operations Data File, ESA Operations Data File, NASDA Operations Data File, RSA Operations Data File, U.S. Systems Operations Data File, and U.S. Payload Operations Data File.

Operations Data File Control Board - Develops, approves, and ensures the maintenance of ODF policies and protocols used to develop, manage, produce, and distribute the ODF. Comprised of representatives from control forums of each component of the ODF. These control forums are established to provide the day-to-day management of each component under the guidelines and policies contained within the ODF Management Plan (SPIP, Vol. VIII, Appendix C).

Operations Nomenclature (Op Nom) - Document which contains nomenclature to be used by all ISS participants. Payloads will provide unique nomenclature for inclusion.

Parameter - Measurement or host data received via the workstation data acquisition system.

Parametric Data - Data or a set of data that is a characteristic property (of a system, component, or operation) that can be assigned a name and a discrete value (pressure, temperature, amperage, etc.). See also data source information.

Payload - Specific aggregate of equipment, software, specimens, and/or other items that is designated and treated as a collective whole in support of one of more experiments. An individual payload may be uniquely associated with one experiment, or it may serve as common use equipment for a group of experiments.

Payload Information Management System - The system used for the configuration management, residency, and storage of U.S. PODF procedures. This is the site where U.S. PODF will be available for download or viewing.

Payload System Operating Procedures (PSOP) - Payload support system operating procedures, usually generic procedures, which are available to all PDs to be incorporated within specific payload procedures. They include, but are not limited to, PLSS and LSE.

U.S. Payload Operations Data File - Procedures, reference information, and associated auxiliary information required for the support of U.S. and ASI ISS payloads. The U.S. PODF includes nominal, maintenance, quick-response, and malfunction procedures required for payloads, and associated reference information (e.g., schematics).

Payload Operations Integration Center - Facility that will integrate all U.S. user payload operations activities. This includes the development of the integrated user operations plans and realtime management of user operations.

Payload Procedures - Procedures that only involve operations of Station payloads.

U.S. PODF Increment Manager - The U.S. PODF Increment Manager manages U.S. PODF day-to-day activities, supports the U.S. PODFCB, and is responsible for the detailed implementation of the U.S. PODF Management Plan and its Annexes for a specific increment.

Portable Computer System - Crew computer system consisting of processor, keyboard, track ball, hand controllers, primary display, and secondary displays. The PCS is the device used by the crew to interact with the on-board flight software.

Powerdown - Procedures used to intentionally and methodically remove power from and cease operations of systems or subsystems for the purpose of power conservation, load switching, maintenance, or diagnostic troubleshooting.

Procedure Hazard Control List - File developed and maintained by the PD which identifies specific location (e.g., file and step number(s)) of procedural hazard controls and references the corresponding Hazard Report and Hazard Control numbers.

Product Group - Portion of the total design, test, or production of the Space Station assigned to a specific NASA center and their associated contractors. Three NASA centers are each responsible for part of the work.

Procedure - Approved method of attaining an objective through the execution of a predetermined sequence of steps (actions or commands). Procedural goals include accomplishing a desired action or condition, obtaining or generating information, or all of the above. A procedure can be automated, manual, or semi-automated and used by the crew, the software, or ground operators.

Procedure Development and Control - The system used for the development and configuration management of U.S. SODF procedures.

Procedure Management Office - The governing body that is responsible for the day-to-day management of the U.S. SODF and supports the U.S. SODFCB.

Procedure Validation Lead - Individual who initiates, plans, and conducts procedure validation session for the U.S. PODF. As this is validation, it will likely be a member of the Experiment Development Team.

Procedure Validation Records - Records that document the results of PV sessions. PV records are maintained by the File Managers and reviewed by Operations Management prior to the start of an increment to certify the procedures.

Procedures Executor Software - The procedures executor software, located on board the ISS, is software which executes the procedures embodied in a compiled procedure script. This software reads and responds to a set of realtime commands that allows a user to control script execution. The procedures executor software outputs its execution status for use in monitoring procedure execution.

Quick-Response Procedures - Procedures used to quickly safe the system or payload in the event of a failure or anomaly in the nominal operation of the system or subsystem components. These procedures must be accomplished within a limited amount of time (approximately 5 minutes), in order to prevent propagation of failures to other systems or components and to prevent danger to the crew and/or the Space Station.

Realtime - (For use in defining the change process required for a procedure) The period of time covered by the current On-board Short Term Plan.

Reference Information - Non-executable information and non-procedural data used to aid in Station operations (e.g., schematics, photographs).

Reference Table - Information associated with a procedure or reference information. The table may include such information as associated procedures, objects called out, attributes called out, procedure author, date created, increment supported, system supported, etc.

Safe - Command function used to eliminate or control hazards.

Safety of Flight - Procedures, parameters, or other flight-related items for which inaccuracies, omissions, or errors therein would result in loss of life, injury, or critical equipment damage.

Satisfaction - The comfort and acceptability of use.

Schematics/Drawings - Detailed high-level overview diagrams and drawings used for system familiarization, diagnostic troubleshooting, or equipment location.

Segment - All on-orbit hardware and software belonging to an ISS participant.

Simulation - Rehearsal demonstrating how a system will perform under specified conditions, producing results that the system under consideration should produce.

Simulator - Representation of flight hardware or software which generally has a high level of functionality. It provides crew interaction with math-modeled spacecraft systems and payloads.

Single Element Procedures - Contain steps that involve only the operation of a single element.

Single System Procedures - Contain steps that involve only the operation of a single system within an element.

Source Data - Systems Operating Procedure or system reference information from which a procedure or associated reference information is developed.

Space Support Computer - Crew computer system consisting of processor, keyboard, track ball, hand controllers, primary display, and secondary displays. The SSC is the device used by the crew to interact with the on-board flight software and the MPV.

Space Station Training Facility - Facility containing the primary simulation devices used to train crewmembers and ground support personnel in the operation of the ISS. It is comprised of four module systems trainers, two part task trainers, the Station network simulator, four computer-assisted instructional trainers, and a complement of instructor stations and briefing rooms. In addition, the SSTF will be used for ISS integrated systems procedures and systems development and validation.

Space Transportation System - Integrated system consisting of Space Shuttle (orbiter, external fuel tank, solid rocket boosters, and flight kits) and any associated flight hardware and software.

Step - Logical break of operations based on factors such as location, crewmember, time, hardware, events, etc.

Support Document - Documents containing procedures that are mainly used to accomplish specific objectives and which are appropriately referenced in the short-term plan.

System Operating Procedure (SOP) - Information that supports contractor and International Partner delivered hardware and software such as operational, contingency, maintenance, assembly, and activation information. ODF procedures are developed from SOPs.

Systems Operations Data File - Procedures, reference information, and associated auxiliary information required for the support of the ISS U.S. systems. The U.S. SODF includes nominal, maintenance, quick-response, and malfunction procedures required for the core systems, integrated system/payload procedures, extravehicular activity procedures, robotics procedures, transfer procedures, crew-related procedures, and associated reference information.

Systems Operations Data File Control Board - Governing body and mechanism for approval of overall U.S. SODF procedure standards. Also responsible for configuration control of U.S. SODF to ensure that the technical content of the procedures is correct.

Timeline - The planned activity schedule for astronauts on an ISS mission.

TIMELINER Compiler - Software used to compile ASCII text files into executable ODF procedures.

Trainer - Representation of flight hardware that can have a fairly high degree of physical fidelity and can also have some degree of functional fidelity. It falls between a mockup and a simulator in terms of physical and functional fidelity. A mock-up can develop into a trainer over time as flight hardware becomes better defined.

Transfer Plan - Those activities which support the transfer of cargo and crew between the Shuttle and ISS.

Update Files - Update Files contain new procedures, major additions/changes to existing procedures and/or procedures which are applicable to a specific flight. Procedures which are destined for the Baseline File will originate in Update Files.

Uplink - Transfer of data from ground facilities to the ISS.

Usability - The extent to which crewmembers can operate the payload per the payload procedures with effectiveness, efficiency, and satisfaction in a specified context of use.

Validation - Per the ODF Management Plan, procedure (and by extension, display) validation is the process by which a procedure (or display) is checked to assure that it is technically accurate, conforms to standards, meets safety requirements, does not interfere with other procedures (or displays), and achieves the desired results.

Verification - Per the ODF Management Plan, procedure (and by extension, display) verification is the process by which a procedure (or display) is checked to assure that it conforms to standards, meets safety requirements, and does not interfere with other procedures (or displays).

Version Identifier - Number, character, field containing numbers and/or characters to denote a unique edition of a procedure or reference information.

APPENDIX C

U.S. PODF MANAGEMENT PLAN ANNEXES

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C, U.S. PODF MANAGEMENT PLAN ANNEXES

Annex 1, U.S. PODF Definition

A. Lists the U.S. PODF files and defines what types of procedures, displays, and reference data are in each file

B. Defines the roles in managing U.S. PODF files

C. Defines the publication groups (increment update, baseline)

D. Defines the publication groups for each U.S. PODF file

E. Defines what increment each U.S. PODF file will be phased in to support

F. Defines which U.S. PODF files will have paper backup

G. Defines which electronic U.S. PODF files will be required on board at all times

H. Defines what workstation support items are included in U.S. PODF (e.g., printer paper, pens, pencils)

I. Defines the hardcopy U.S. PODF on-board configuration and stowage

J. Defines how the increment-specific U.S. PODF structure is documented

Annex 2, U.S. PODF Configuration Control

A. Defines the U.S. PODF CR process

B. Defines the CRs that will be reviewed by the U.S. PODFCB

C. Defines the implementation priorities for the CRs

D. Describes the configuration control process for the U.S. PODF in PIMS

E. Defines PIMS user group/access control

F. Defines realtime (simulations and increment operations) procedure & display updates

G. Defines unique configuration control standards, protocol, and processes for decals, cue cards, and Velcro

H. Lists the standard mandatory reviewers for CRs

I. Defines the criteria for CRs to go to the U.S. PODFCB

J. Defines the criteria for CRs to go to the ODFCB

Annex 3, U.S. PODF Procedure Verification and Validation

A. Defines PV process, tools, facilities, and participants

B. Defines the contents of and reviews necessary for PV records

C. Describes the realtime PV process

D. Lists source data required for each U.S. PODF file and dates for the source data deliveries

E. Describes the Safety Verification Process

Annex 4, U.S. PODF Preparation and Publication Plan

A. Describes the process for preparing U.S. PODF products (electronic, paper, etc.) for training and for flight

B. Defines the U.S. PODF Procedure Handbook guidelines

C. Describes the methods for publishing U.S. PODF products

D. Defines the U.S. PODF production template

Annex 5, U.S. PODF Payload Display Review Plan

A. Defines the Payload Display Review Panel (PDRP) organization authority, roles and responsibilities

B. Defines the display review and approval process

C. Defines the display integration, verification and testing

D. Defines the display interfaces

Annex 6, U.S. PODF Payload Display Developers Guide

A. Defines the objectives and principles of usability

B. Defines the Human Computer Interface (HCI) prototyping/development process including task list generation, operations requirement analysis, and iterative prototype development

C. Defines assessment methodologies and evaluation metrics

Annex 7, U.S. PODF Timeliner Automated Procedures

A. Defines U.S. PODF automated procedures

B. Defines the roles and responsibilities in producing and maintaining U.S. PODF automated procedures

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APPENDIX D

DOCUMENT TO BE DETERMINED (TBD) INFORMATION

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D, DOCUMENT TO BE DETERMINED (TBD) INFORMATION

TO BE DETERMINED/TO BE RESOLVED

<TBR 01:PODFCB> Main Volume PODF Management Plan: Information concerning display baselining process needs to be added to the document.

<TBD 02:PODFCB>MSFC Space Station Payload Operations Integration Configuration Management Plan, document number TBD

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